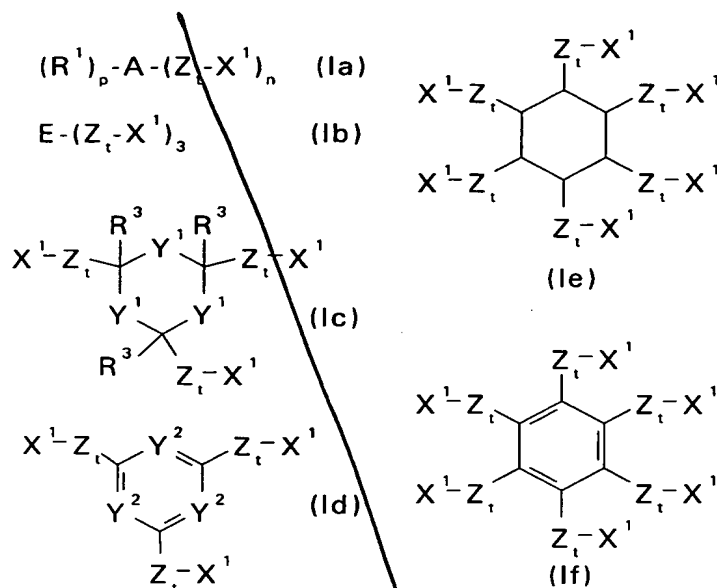


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wherein: A is carbon or silicon; E is nitrogen or P(O); R¹ and R³ are each independently hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclylalkyl; p is 0 or 1; Z is any combination of 1-12 units selected from 1,4-phenylene and methylene units, which units may be combined in any order, with the proviso that if the LPC is of formula (Ia) or (Ib), then Z contains at least two phenylene or methylene units; t is 1; X¹ is OH, SH, NH₂, COR⁵ or COOR⁴ where R⁴ is selected from hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl and heterocyclylalkyl, and R⁵ is halide, heteroaryl or pseudohalide; n is 3 or 4; Y¹ is CH₂, NH, S or O; Y² is selected from CH and N; R¹, R³, X¹, Y¹, Y² and Z are unsubstituted or substituted with one or more substituents each independently selected from Q; and Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxycarbonyl, aryloxycarbonylalkyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl,

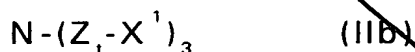
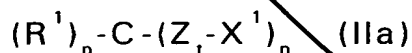
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~~arylamino, carbonyl, diarylamino, carbonyl, arylalkylamino, carbonyl, alkoxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy, arylalkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylamino, dialkylamino, arylamino, diarylamino, alkylaryl, amino, alkylcarbonylamino, alkoxy, carbonylamino, aryloxy, carbonylamino, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyno, isothiocyano, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylamino, sulfonyl.~~

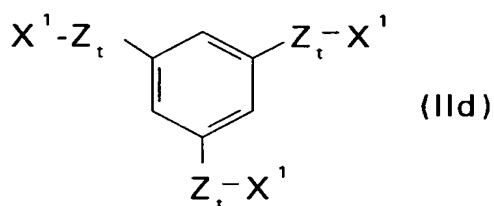
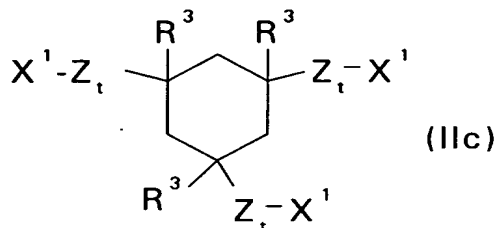
7. (Amended) The LPC of claim 6, wherein Z is a group with three or more points of attachment: one to A, E, or the cyclic nucleus, and the others to two or more X¹ groups.

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9. (Amended) The LPC of claim 6, wherein: A is carbon and E is nitrogen.

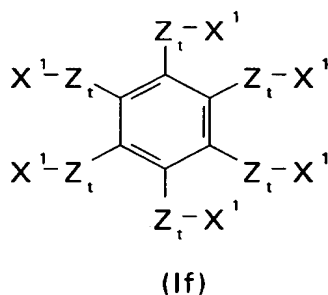
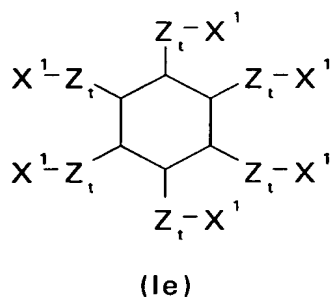
10. (Amended) The LPC of claim 6, wherein the LPC has formulae (IIa) or (IIb):



B³
17. (Amended) The LPC of claim 6, wherein the LPC has formulae (IIc) or (IId):



22. (Amended) The LPC of claim 6, wherein the LPC has formulae (Ie) or (If):



B⁵

29. (Amended) The LPC of claim 6 that is coupled to a photocleavable linker.

B⁶

31. (Amended) A liquid phase carrier (LPC), selected from the group consisting of tetrakis{6,9-diaza-13-[5'-O-(4,4'-dimethoxytriphenylmethyl)-2'-deoxythymidine-3'-O-yl]-2-oxa-5,10,13-trioxotridecyl}methane ((DMT-dT)₄-PE-LPC), 1,3,5-tris{2,5-diaza-9-[5'-O-(4,4'-dimethoxytriphenyl-methyl)-2'-deoxythymidine-3'-O-yl]-1,6,9-trioxononyl}-benzene ((DMT-dT)₃-Aryl-LPC), tetrakis[13-(2'-deoxythymidin-3'-O-yl)-6,9-diaza-2-oxa-5,10,13-trioxotridecyl]-methane (dT₄-PE-LPC), 1,3,5-tris[9-(2'-deoxythymidin-3'-O-yl)-2,5-diaza-1,6,9-trioxononyl]-benzene (dT₃-Aryl-LPC), tris-{3-aza-4,7-dioxo-7-[5'-O-(4,4'-

dimethoxytriphenylmethyl)-2'-deoxythymidine-3'-O-yl]-heptyl}-amine ((DMT-dT)₃-Amine-LPC) and tris[3-aza-7-(2'-deoxythymidine-3'-O-yl)-4,7-dioxoheptyl]-amine (dT₃-Amine-LPC).

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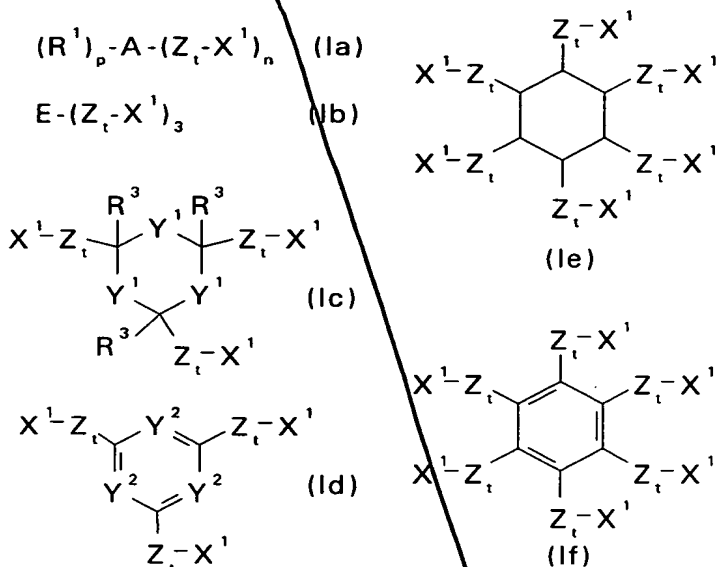
32. (Amended) The LPC of claim 31 selected from the group consisting of tetrakis{6,9-diaza-13-[5'-O-(4,4'-dimethoxytriphenylmethyl)-2'-deoxythymidine-3'-O-yl]-2-oxa-5,10,13-trioxotridecyl}methane ((DMT-dT)₄-PE-LPC), 1,3,5-tris{2,5-diaza-9-[5'-O-(4,4'-dimethoxytriphenyl-methyl)-2'-deoxythymidine-3'-O-yl]-1,6,9-trioxononyl}-benzene ((DMT-dT)₃-Aryl-LPC), tetrakis[13-(2'-deoxythymidin-3'-O-yl)-6,9-diaza-2-oxa-5,10,13-trioxotridecyl]-methane (dT₄-PE-LPC), 1,3,5-tris[9-(2'-deoxythymidin-3'-O-yl)-2,5-diaza-1,6,9-trioxononyl]-benzene (dT₃-Aryl-LPC), tris-{3-aza-4,7-dioxo-7-[5'-O-(4,4'-dimethoxytriphenylmethyl)-2'-deoxythymidine-3'-O-yl]-heptyl}-amine ((DMT-dT)₃-Amine-LPC) and tris[3-aza-7-(2'-deoxythymidine-3'-O-yl)-4,7-dioxoheptyl]-amine (dT₃-Amine-LPC).

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39. (Amended) A method of solution phase biopolymer synthesis, comprising the steps of:

(a) reacting an LPC with a first monomer N¹; wherein the LPC has formulae (I):

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wherein: A is carbon or silicon; E is nitrogen or P(O); R¹ and R³ are each independently hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclylalkyl; p is 0 or 1; Z is any combination of 0-12 units selected from 1,4-phenylene and methylene, which units may be combined in any order; t is 0 or 1; X¹ is OH, SH, NH₂, COR⁵ or COOR⁴, where R⁴ is selected from hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl and heterocyclylalkyl; and R⁵ is halide, heteroaryl or pseudohalide; n is 3 or 4; Y¹ is CH₂, NH, S or O; Y² is selected from CH and N; R¹, R³, X¹, Y¹, Y² and Z are unsubstituted or substituted with one or more substituents each independently selected from Q; and Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy,

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arylalkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylamino, dialkylamino, arylamino, diarylamino, alkylaryl amino, alkylcarbonylamino, alkoxycarbonylamino, arylcarbonylamino, aryloxy carbonylamino, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyno, isothiocyno, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylamino-sulfonyl;

(b) separating and purifying the product of step (a);

(c) reacting the product of step (b) with a second monomer N^2 , a dimer N^2-N^3 or a trimer $N^2-N^3-N^4$; and

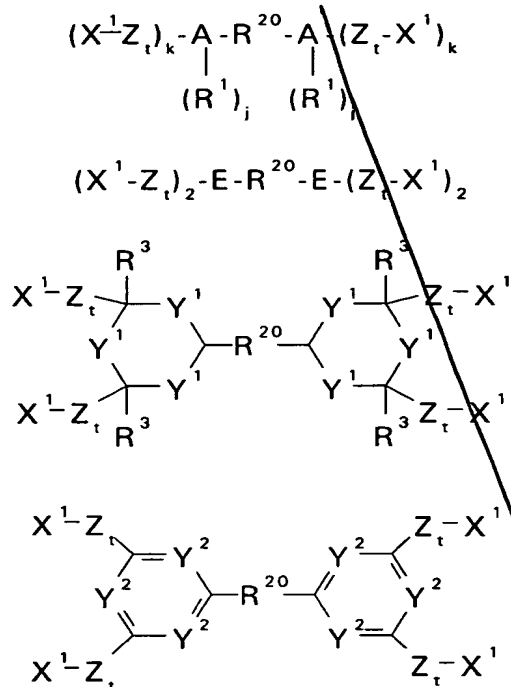
(d) repeating steps (b) and (c) to produce an LPC-bound biopolymer having m monomers, where m is 3 to 100, wherein:

$N^1, N^2, N^3 \dots N^m$ are biopolymer monomers; and
the dimers and trimers comprise the monomers.

40. (Amended) The method of claim 39, wherein the LPC is selected from the group consisting of tetrakis{6,9-diaza-13-[5'-O-(4,4'-dimethoxytriphenylmethyl)-2'-deoxythymidine-3'-O-yl]-2-oxa-5,10,13-trioxotridecyl}methane ((DMT-dT)₄-PE-LPC), 1,3,5-tris{2,5-diaza-9-[5'-O-(4,4'-dimethoxytriphenyl-methyl)-2'-deoxythymidine-3'-O-yl]-1,6,9-trioxononyl}-benzene ((DMT-dT)₃-Aryl-LPC), tetrakis[13-(2'-deoxythymidin-3'-O-yl)-6,9-diaza-2-oxa-5,10,13-trioxotridecyl]-methane (dT₄-PE-LPC), 1,3,5-tris[9-(2'-deoxythymidin-3'-O-yl)-2,5-diaza-1,6,9-trioxononyl]-benzene (dT₃-Aryl-LPC), tris-{3-aza-4,7-dioxo-7-[5'-O-(4,4'-dimethoxytriphenylmethyl)-2'-deoxythymidine-3'-O-yl]-heptyl}-amine ((DMT-dT)₃-Amine-LPC) and tris[3-aza-7-(2'-deoxythymidine-3'-O-yl)-4,7-dioxoheptyl]-amine (dT₃-Amine-LPC).

45. (Amended) A liquid phase carrier (LPC) that has formulae:

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wherein: A is carbon or silicon; E is nitrogen or P(O); R¹ and R³ are each independently hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclylalkyl; Z is any combination of 1-12 units selected from 1,4-phenylene and methylene, which units may be combined in any order, with the proviso that if the LPC is of formula (Ia) or (Ib), then Z contains at least two phenylene or methylene units; t is 0 or 1; X¹ is OH, SH, NH₂, COR⁵ or COOR⁴, where R⁴ is selected from hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl and heterocyclylalkyl; and R⁵ is halide, heteroaryl or pseudohalide; Y¹ is CH₂, NH, S or O; Y² is selected from CH and N; R¹, R³, X¹, Y¹, Y² and Z are unsubstituted or substituted with one or more substituents each independently selected from Q; and Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl,

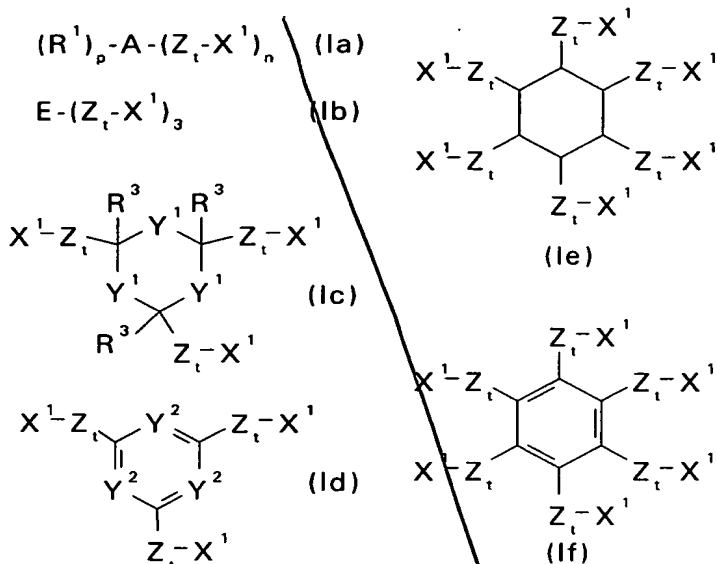
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heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxy, aryloxy, aryloxy, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, arylaminocarbonyl, diarylamino, arylalkylaminocarbonyl, alkoxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy, arylalkoxy, amino, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, arylaminoalkyl, diarylaminoalkyl, alkylamino, dialkylamino, arylamino, diarylamino, alkylarylmino, alkylcarbonylamino, alkoxycarbonylamino, arylcarbonylamino, aryloxy, aryloxy, aryloxy, azido, alkylthio, arylthio, perfluoroalkylthio, thiocyno, isothiocyano, alkylsulfinyl, alkylsulfonyl, arylsulfinyl, arylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, arylaminosulfonyl or diarylamino, arylaminosulfonyl; R²⁰ is alkylene, alkenylene, alkynylene, arylene or heteroarylene; k is 2 or 3; and j is 0 or 1.

47. (Amended) The method of claim 39, wherein the monomers are nucleotides, nucleosides, natural or unnatural amino acids, protein nucleic acid (PNA) monomers or monosaccharides.

~~48. (Amended) A method of solution phase biopolymer synthesis, comprising the steps of:~~

(a) reacting an LPC with a first monomer N¹; wherein the LPC has formulae (I):



wherein: A is carbon or silicon; E is nitrogen or P(O); R¹ and R³ are each independently hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl or heterocyclylalkyl; p is 0 or 1; Z is any combination of 0-12 units selected from 1,2-, 1,3- or 1,4-phenylene and alkylene, which units may be combined in any order; t is 0 or 1; X¹ is OH, SH, NH₂, COR⁵ or COOR⁴, where R⁴ is selected from hydrogen, alkyl, aryl, aralkyl, heteroaryl, heteroaralkyl, heterocyclyl and heterocyclylalkyl; and R⁵ is halide, heteroaryl or pseudohalide; n is 3 or 4; Y¹ is CH₂, NH, S or O; Y² is selected from CH and N; R¹, R³, X¹, Y¹, Y² and Z are unsubstituted or substituted with one or more substituents each independently selected from Q; and Q is halogen, hydroxy, nitrile, nitro, formyl, mercapto, carboxy, alkyl, haloalkyl, polyhaloalkyl, aminoalkyl, diaminoalkyl, alkenyl containing 1 to 2 double bonds, alkynyl containing 1 to 2 triple bonds, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, alkylidene, arylalkylidene, alkylcarbonyl, arylcarbonyl, heteroarylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl, aryloxycarbonyl, aryloxycarbonylalkyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, arylaminocarbonyl, diarylaminocarbonyl, arylalkylaminocarbonyl, alkoxy, aryloxy, perfluoroalkoxy, alkenyloxy, alkynyloxy,